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XIII.—*On the Invention of Writing Materials in reference to Ethnology.* By JOHN CRAWFURD, Esq., F.R.S.

[Read April 10th, 1866.]

I HAVE no intention in this paper of attempting to discuss the large subject of Materials for Writing, and shall confine myself to the question in its bearing on the early history of man, and in so far only as it tends to illustrate the character of the various races into which man is divided. Most probably, the first material on which writing would be attempted would be sand; but this evanescent matter, we can readily believe, would soon be abandoned for the bark of living trees, and this again for the more durable material of stone; and the adoption of this last substance necessarily argues the previous invention of the metals. The Hebrew laws were inscribed on tables of stone in the time of Moses; and most probably, at the time the writing on these tables was executed, the art of engraving on stone was already well known to the Jews. Even the time of Moses carries us back to an era some sixteen centuries before the birth of Christ; but Egyptian inscriptions on stone carry us back to an antiquity in the art of stone engraving by thousands of years beyond the age of Moses.

Wherever the art of writing has been invented, the practice of writing on stone, at least for enduring purposes, has obtained; and hence we find, not only in Egypt, but in Persia, India, the Hindu-Chinese countries, and the Malay Islands, stone inscriptions of great, but too often of unascertainable antiquity, and usually in obsolete characters.

Plates of ivory, copper, and bronze probably followed stone; but writing on such expensive materials could only have been for lasting purposes, and it yet remained to discover a material for current and familiar use. The inhabitants of the tropical and sub-tropical countries of Asia would have such a material at hand in the fronds or leaves of palms, and must early have had recourse to it, and it is still largely employed in Southern India, in extra-gangetic India, and in the Malayan Islands. The palms which furnish it are the *Tal* and the *Palmeira*, or respectively the *Corypha tallia* and *Borassus flabelliformis* of botanists. The first of these is the palm which chiefly supplies the writing material. The leaf, before attaining maturity, and as yet soft and pliant, is macerated, pressed, dried, and cut into slips of from twelve to eighteen inches long and about three broad, which are at once fit to write on. A volume consists of a

number of these strung loosely by a cord passed through the middle of the leaf, or by one at each end. A hole through the middle of the leaf seems to have been the more general practice of the Hindus, and such slaves of habit are they that after coming to write on paper with ink, the paper was cut into slips, of the form of the slips of palm leaf, and a blank space left for the spot where the cord used to pass in the old material.

The writing on the palm leaf is executed with a style in the same manner as was practised by the Greeks and Romans when they wrote on waxed tablets. To make it more conspicuous, the leaf is sprinkled over with powdered charcoal, which, remaining in the grooves, assists in bringing out the writing. Still the yellow colour of the material, and the smallness of the letters, which necessarily consist entirely of hair-strokes, make palm-leaf writing so obscure, that a manuscript is rather deciphered than read. The difficulty is greatly enhanced in practice by the habit of leaving no interval between words, or even sentences, so that a whole sentence, or even paragraph, seems to the eye but a single word. Notwithstanding its inconvenience, writing on palm leaves has in several parts survived the introduction of paper, as in Southern India, in the country of the Burmese, Siamese, and Cambodians, and in some parts of the Malay Archipelago.

The palm leaf, as might be looked for, is in India closely connected with the invention of writing. The Sanskrit name for the *Corypha* palm, extended, however, frequently to the *Borassus*, is *tala*, vernacularly *tal*, and *tali*. From this comes *talpatra*, and, vernacularly, *talpat*, literally, leaf of the tal palm, and applied to the dried leaves of this palm, whether used as parasols or as leaves to write on. This is the word which Europeans have corrupted into *talpot*. In Javanese, and from it into Malay, we have a strange orthographic perversion of this word. The name not only of the palm itself but of slips cut from the leaf for the purpose of writing, is *rontal*. The first syllable here is *ron*, the Javan word for leaf, and this is but a translation of the Sanskrit *patra*, both words, of course, equally meaning the leaf of the tal palm. But the perversion is not yet complete; for the Malays, by exchanging for each other the liquids at the beginning and end of the compound word, make the word *lontar*.

The Greeks and Romans had no more convenient a material than waxed wooden boards, written on with a style, until the Egyptians came to their assistance with their papyrus; but at what time they began first to avail themselves of this material, or at what time the Egyptians themselves first employed it, is, I believe, wholly unknown. The papyrus was the produce of a tall reed growing in the marshy land of Lower Egypt. The pellicle surrounding the stem of this plant, the *Papyrus antiquorum*,

was cut into ribbons, which, glued together, and subjected to pressure, formed the best writing material of the polished Greeks and Romans. The papyrus plant is at present rare in Egypt; but, as this country was the sole seat of the manufacture which supplied the whole Roman world with the article, it is to be inferred that it must at one time have been an extensive object of cultivation.

The process by which the ancient papyrus was made, it may be observed, much resembles that by which the cloth of the South Sea islanders, and the native paper of Java, called in the language of that island *diluwang*, is made from the liber or inner bark of a shrub of the natural order of *urticæ* or nettles, and named by botanists the *Broussonetia papyrifera*; with this difference, however, that the raw material of the rude islanders far excels in quality and in abundance that of Egypt, while the fabrics made from it, and with which are clothed the otherwise naked Polynesians, are in every respect of a better quality than that on which the productions of the genius of Greece and Rome were written.

The word Papyrus is not traceable beyond the Latin. In Greek the name given to it was *Kartis*, corrupted in Latin into *Charta*; and from these two words come the names for paper, in the modern languages of Europe, as the French *papier*, the English *paper*, the Spanish *papel*, and the Italian *carta*.

Some writers have ascribed the invention of true paper to the Arabs of Spain, but the conjecture seems to be sufficiently refuted by the fact that the name for paper in Arabic is the Greek one, with very little alteration, namely, *kartas*. Had it been a native invention, it would certainly have borne a native name; but the Arabs seem to have taken the name from the Greeks of Egypt, the Greek name being that by which the papyrus was known in that country when the Arabs conquered it. The Arabs, it is to be observed, although, in the course of their conquests, they were certainly the instruments of diffusing some foreign arts among the nations they subdued, do not appear themselves to have ever made any notable discoveries. We may, then, be tolerably sure that the wonderful and beautiful discovery of paper was not an invention of the Arabs of Spain or of any other country. Neither was it an invention of the Hindus, for in Sanskrit there is not even a name for paper, and the usual ones in the modern languages of India are taken from the Persian. The Persian name itself, *kaghas*, is only a corruption of the Greek word through the Arabic. That the Persians had not invented paper, or received the manufacture from abroad in the fifth century, may, I think, be inferred from the fact that down to that time a considerable intercourse had existed between them and the people of the Eastern Empire,

who would surely have acquired so useful an art, had it been known in Persia.

The Arabs who conquered Transoxiana or Turkistan, in the first century of the Mahomedan era, are said to have found the manufacture of paper carried on in the city of Samarcand as early as A.D. 706. But so rude a race as the Tartars were, and still are, were by no means a likely people to have fallen upon the difficult discovery of paper-making. From these Tartars, however, it seems not unlikely that the Arabs first learnt the art which they, in their turn, eventually conveyed to their western conquests, including Spain, where most probably the civilised nations of Europe first saw the process of manufacture.

Paper, at first made of cotton, began to take the place of papyrus in the tenth century, and in the eleventh and twelfth had wholly superseded it. The Greeks of the Lower Empire were the first to adopt it, and were themselves, most probably, the manufacturers.

The real discoverers of paper were the Chinese—the same ingenious people who discovered silk and porcelain. Even in China, civilisation had already made great progress before the Chinese had fallen on this curious, and by no means obvious, invention: for, according to their own reckoning, it was not made until the close of the first century of the Christian era (A.D. 95), that is, about three centuries after the building of the Great Wall. In the time of Confucius, the Chinese wrote with a style on the prepared bark of the bamboo cane. Afterwards, they advanced to writing on silk cloth with a pencil, and it is from this practice that the name for paper, *chy*, is taken, for the word is the same as that for silk. As Confucius lived 500 years before the birth of Christ, a period of about 600 years had, therefore, elapsed from the time of scratching on the bamboo bark to the invention of paper.

The principal raw material of paper in China is the bamboo cane, softened by long maceration in water, then ground to a pulp in mortars, and finally manufactured by a machinery similar to the European, but rude, yet economical. A coarse paper is made from rice straw, and the finest from cotton and the inner bark of the paper mulberry, or *Broussonetia papyrifera*, already mentioned.

From China there can be little doubt that the art of paper-making reached Japan, where paper is even of more universal use than in China itself. The Arabs, after their conquest of Turkistan or the ancient Transoxiana, found the manufacture of paper carried on in Samarcand. This was in the first century of the Mahomedan era, and the year of Christ 706; but of the time when it was first commenced there, there is, of course, no record. In all probability, the manufacture was introduced from China, and there

was ample time for its introduction in the lapse of better than six centuries since the invention had been made in China itself. How the discovery should have reached the rude Turcomans is sufficiently intelligible. A commercial intercourse of great antiquity has existed between the Turcomans and the Chinese. It still exists, and it is through it that the Turcomans are furnished with silk, with porcelain utensils, and with tea—an article of universal consumption among them. It was by the same channel that the silk of China, and, perhaps, even the celebrated Murrhæne vases, reached the distant markets of Rome, enormously enhanced in cost.

The Persians most probably received the art of paper-making from the Turcomans, and it was they who introduced it into India, as is shown by the only name which it bears in the vernacular languages, namely, the Persian *kaghas*. The Burmese and Siamese manufacture a coarse paper of their own, by a rude process resembling that of the Chinese, and, I doubt not, borrowed directly from them. The more advanced nations of the Malayan Archipelago wrote on palm leaves only, but now more generally they write on imported paper, never having themselves learnt the art of manufacture. Their paper is European or Chinese, and always known to them by its Greek name *kartas*, taken from the Arabs, whose first recorded appearance in the Archipelago does not go back beyond six centuries.

The invention of printing is stated to have been made in China a century before it had been made in Europe—that is, in the fourteenth instead of the fifteenth century. In Europe, it had soon followed the introduction of paper; but in China we are surprised to find that it did not take place until twelve centuries after that event. Printing is still in China what it was when originally invented. This consists of stereotype printing by wooden blocks, one side of the paper only being printed, so that a Chinese book is double the size of a European for the same amount of letter-press. The use of metallic types is unknown to the Chinese, and a language without an alphabet forbids printing by movable types.

The art of printing, as practised by the Chinese, has been borrowed by the Japanese and Anamese, but by no other Asiatic people. With the few exceptions of Asiatic nations under the direct influence of Europeans, the books of all other oriental people continue to be in tedious, expensive and uncertain manuscript.

A few words will be sufficient to describe the implements at various times and by various nations used for writing with. The Greeks and Romans wrote on their waxed tablets with a sharp pointed iron instrument, the stylus—a word which, with trifling

changes, has been received into all the modern languages, but chiefly in the metaphorical senses of, firstly, manner of writing; and secondly, manner of doing anything. The same implement was used, and still continues to be so, by the Hindus, and all other nations who write on palm leaves. A similar instrument must have been employed by the Chinese before the discovery of paper, and while they were confined to the bark of the bamboo cane. From the mere fact of the use of the style, we may infer, what is otherwise probable, that the invention of iron preceded the discovery of the art of writing; for we have no account of any people who had a knowledge of letters, who were unacquainted with iron.

On the discovery of the papyrus, and the use of liquid ink, the universal implement for writing with was the reed, the *calamus* of the Greek and Latin. This is the *kalam* of the Arabs, and through the Arabs of the Persians, Hindus, and even Malays. The Arabic name is most probably but a corruption of the Greek, and received from the Greeks at the same time as that in which they borrowed the name for paper. The reed still continues to be the universal writing implement from the Dardanelles to the western limits of China, and, if we are to judge by the beauty of the manuscripts, especially the Arabic and Persian, is better suited than the pen for the writing of the oriental characters.

The goose quill is said not to have superseded the reed in Europe until the eighth century, or several centuries before the introduction of paper, so that many *papyri* must have been written with the quill. The names for the quill in all the modern languages of Europe show the source from which they originated—the Latin word for a feather, *penna* and *pluma*, being the source of all of them. Thus we have the *pluma* of the Spanish, and the *plume* of the French, the *penna* of the Italian, the *pen* of the English, and the *píann* of the Gaelic. The invention of the metallic pen has by no means superseded the quill, for, independent of our domestic supply, we import yearly, chiefly from Russia, close to the number of seventeen millions of goose quills.

Etymology throws some light, not only on the invention of writing, but even on the history of the dissemination of the art. The literal meaning of the Greek verb *grapho*, is to scratch, to scrape, to grave; and 'to write' is but a metaphorical one derived from it. Scholars have shown that the word does not exist in the Homeric poems in the sense of writing, and but once in the sense of delineating by making a mark; that is, by making a score. In the sense of delineating by written letters, it occurs for the first time in Herodotus, three centuries after the computed time of the Homeric poems.

The Latin verb *scribo*, like the Greek *grapho*, meant at first to mark or scratch with a sharp point, and came eventually also to signify to delineate letters by scratching, or to write. No doubt, both the Greek and Latin word had reference to forming letters on a hard surface, that is, writing or engraving on stone. The nations of Western Europe, who were themselves wholly ignorant of letters, and indebted for them to the Romans, afford in their languages sufficient evidence of this in their universal adoption of the Latin word, always more or less corrupted, and in some cases to the extent of utter disfigurement. Thus the Latin *scribo* or *scribere* becomes in Italian *scrivere*, in Spanish *escribir*, in French *écrire*, in German *schreiben*, in Welsh *ysgrifennu*, and in Gaelic *sgriobh*. The derivation of our own word is the greatest puzzle. Skinner, as quoted by Richardson, inclines to think that the verb to write may come from the Dutch word *wroeten*, to plough—that is, to plough into the paper; but as neither the Anglo-Saxons or their contemporaries the Dutch had any knowledge of paper, this etymology is not tenable. It would seem more probable that the Anglo-Saxons, following the example of the other nations, would take the word from the Latin, and that ‘to write’ may be a gross corruption of the Latin *scribo*, probably of its perfect participle.

It is remarkable that the languages of Asia, notwithstanding the remoter era of the invention of written language with them, afford in some instances illustrations of its origin similar to those of the Greek and Latin. In Sanskrit, the verb to write is *likh*, and its literal meaning, to scratch, to scarify, and its metaphorical, to write, or delineate by letters, and also to paint or delineate pictorially. I owe this derivation to a learned Dane, Mr. Westergaard, to whose work, the *Radices Sanscritæ*, my attention has been directed by a distinguished orientalist, Mr. Fitzedward Hall, the Curator of the Library of the Indian Home Government. It is a corroboration of this etymology, that the name for the Hindu stylus, *likni*, is derived from the verb, and literally means “a scraper,” while the same word in the vernacular language of Upper India, is the usual name for a pen of whatever material.

The verb to write, in the Malay and Javanese languages, is *tulis*, but the word equally means to delineate or form lines, and to paint. If other oriental languages were closely examined, they would probably furnish similar evidence.